# Mth 271

## COURSE OUTLINE

### Prerequisites:

**MTH 163, MTH 166 or equivalent, or a placement recommendation for MTH 271.**

### Course Description:
**Presents limits, continuity, differentiation of algebraic and transcendental functions with applications, and an introduction to integration.**

### Semester Credits: 3  Lecture Hours: 3  Lab/Recitation Hours: 0

### Course Outcomes

**At the completion of this course, the student should be able to:**

1.  **Evaluate limits and interpret them graphically.**

2.  **Determine the derivatives of algebraic, exponential and logarithmic functions.**

3.  **Solve applied problems with derivatives.**

4.  **Use derivatives to determine the graphical properties of functions.**

5.  **Apply derivatives to solve Exponential Growth and Decay Problems.**

6.  **Determine Indefinite Integrals.**

# Class Name and Number

Required Materials:

Textbook, scientific calculator

Textbook:

University Calculus, Hass, Weir, & Thomas, 3rd edition, Pearson/Addison-Wesley, ISBN # 9780321999580

Topical Description: (Outline chapters and sections to be covered in the book )

## Topical Description

| Section | Topics |
|---|---|
| 1.1 | Limits : A Numerical and Graphical Approach |
| 1.2 | Algebraic Limits and Continuity |
| 1.3 | Average Rates of Change |
| 1.4 | Differentiation using Limits of Difference Quotients |
| 1.5 | Differentiation Techniques : The Power and Sum-Difference Rules |
| 1.6 | Differentiation Techniques : The Product and Quotient Rules |
| 1.7 | The Chain Rule |
| 1.8 | Higher-Order Derivatives |
| | |
| 2.1 | Using 1st Derivatives to Find Maximum/Minimum Values and Sketch Graphs |
| 2.2 | Using 2nd Derivatives to Find Maximum/Minimum Values and Sketch Graphs |
| 2.3 | Sketching Graphs : Asymptotes and Rational Functions |
| 2.4 | Using Derivatives to find Absolute Maximum/Minimum Values |
| 2.5 | Maximum/Minimum Problems ; Business and Economic Applications |
| 2.6 | Marginals and Differentials |
| 2.7 | Implicit Differentiation and Related Rates |

| | |
|---|---|
| **3.1** | **Exponential Functions** |
| **3.2** | **Logarithmic Functions** |
| **3.3** | **Applications : Uninhibited and Limited Growth Models** |
| **3.4** | **Applications : Decay** |
| **3.5** | **The Derivatives of a^x and log x** |
| ***3.6*** | ***An Economics Application : Elasticity of Demand*** |

***(OPTIONAL )***

| | |
|---|---|
| **4.1** | **Antidifferentiation** |
| **4.2** | **Antiderivatives as Areas** |

**Notes to Instructors**
**(List information about optional topics, departmental exams, etc)**

  1. **Keep Chapter 4 on an elementary level.**
  2. **The Final Exam must be comprehensive.**
  3. **Section 3.6 is optional.**